

Inspector General

United States
Department *of* Defense



Implementation and Reporting of the American Recovery and Reinvestment Act of 2009: Government Controls Over Selected Near Term Energy-Efficient Technologies Projects Were Generally Effective

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 FEB 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE Implementation and Reporting of the American Recovery and Reinvestment Act of 2009: Government Controls Over Selected Near Term Energy-Efficient Technologies Projects Were Generally Effective				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Department of Defense Inspector General, 4800 Mark Center Drive, Alexandria, VA, 22350				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 18	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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Acronyms and Abbreviations

ACC	U.S. Army Contracting Command
AFRL	Air Force Research Laboratory
COR	Contracting Officer Representative
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
DFAS	Defense Finance and Accounting Services
FAR	Federal Acquisition Regulation
FPDS	Federal Procurement Data System
GE	General Electric
NTEET	Near Term Energy-Efficient Technologies
NAVAIR	U.S. Navy Naval Air Systems Command
NAICS	North American Industry Classification System
OCRA	Online Registration and Certification Application
OMB	Office of Management and Budget
QASPs	Quality Assurance Surveillance Plans
SBA	Small Business Administration
SBIR	Small Business Innovation Research
TARDEC	U.S. Army Tank and Automotive Research and Development Engineering Center
UAV	Unmanned Aerial Vehicle



INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
4800 MARK CENTER DRIVE
ALEXANDRIA, VIRGINIA 22350-1500

February 1, 2012

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (COMPTROLLER)/CHIEF
FINANCIAL OFFICER
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL
MANAGEMENT AND COMPTROLLER)
DIRECTOR, DEFENSE RESEARCH AND ENGINEERING
DIRECTOR, DEFENSE LOGISTICS AGENCY
NAVAL INSPECTOR GENERAL
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Implementation and Reporting of the American Recovery and Reinvestment Act of
2009: Government Controls Over Selected Near Term Energy-Efficient
Technologies Projects Were Generally Effective (Report No. D-2012-048)

The DoD Office of Inspector General is performing audits of DoD's implementation of Public Law 111-5, "American Recovery and Reinvestment Act of 2009," February 17, 2009 (Recovery Act). We non-statistically selected six Near Term Energy-Efficient Technologies (NTEET) program projects to review, one from each of the Military Departments, one DoD-Wide project, and two Small Business Innovation Research (SBIR) projects. The six projects, totaling approximately \$42 million in Recovery Act funding, were:

- High-Temperature Silicon Carbide Semiconductors - Army - \$12,139,673
- F-18 Energy-Efficiency Improvements - Navy - \$15,000,000
- Hybrid Unmanned Aerial Vehicle (UAV) Renewable Propulsion System - Air Force - \$4,859,929
- Fuel-Efficient Ground Vehicle Demonstrator - DoD-Wide - \$8,748,000
- Advanced Manufacturing Techniques for Large Area Solid-Oxide Fuel Cells and Other Energy Applications - SBIR - \$622,896
- Foil-Bearing Centrifugal Cathode Air Blower - SBIR - \$480,000

Audit Objective

The primary objective of this audit was to determine whether DoD and its Components were implementing the Recovery Act. Specifically, for the six selected NTEET projects, we evaluated the effectiveness of Government controls over contractor performance, recipient reporting, and contracts awarded to qualified small businesses. The Attachment includes a description of the six NTEET projects reviewed and a summary of our review of applicable controls for each project.

Government controls for the NTEET projects for contractor performance, recipient reporting, and contracts awarded to small businesses were generally effective. Generally, contracting officials for the six selected NTEET projects monitored contractor performance and recipient reporting in accordance with the Recovery Act and Office of Management and Budget (OMB) guidance. Contracting officials identified some deficiencies in the contractor's recipient reporting and took corrective action to improve transparency by publishing information on the

appropriate public Government Web sites. Army and Air Force contracting officials ensured that small businesses self-certified in accordance with the appropriate laws and regulations.

Controls Over Contractor Performance Were Generally Effective

Government controls over NTEET project contractor performance were generally effective in the project oversight of Quality Assurance Surveillance Plans (QASPs), contractor recipient reports, contractor-submitted invoices, and the inclusion of the contract clause for Government inspection. Three of the six projects were still in process as of June 30, 2011. In addition, one of the three projects, the Navy's F-18 Energy-Efficiency Improvements, had exceeded timelines for project completion. The Table provides a summary of NTEET project outcomes and the compliance with the Recovery Act, FAR and OMB guidance.

Table. NTEET Project Outcomes

Project Description	Project Completed	Project Completed Within Recovery Act Allocated Costs	Compliant With Recovery Act, FAR, and OMB Guidance			
			QASP	Contractor Recipient Reports	Invoice Oversight	Small Business Certification
High-Temperature Silicon Carbide Semiconductors	Ongoing*	Ongoing*	Yes	Yes	Yes	N/A
F-18 Energy-Efficiency Improvements	Ongoing**	No	No	Yes	Yes	N/A
Hybrid UAV Renewable Propulsion System	Yes	Yes	N/A	Yes	Yes	N/A
Fuel-Efficient Ground Vehicle Demonstrator	Ongoing*	Ongoing*	Yes	Yes	Yes	Yes
Advanced Manufacturing Techniques	Yes	Yes	N/A	Yes	Yes	Yes
Foil-Bearing Centrifugal	Yes	Yes	N/A	Yes	Yes	Yes

*The project is on schedule, within budget, and will be completed in FY 2012.

**The project was delayed and all Recovery Act allocated funds exhausted. The contractor agreed to complete the project at no additional cost to the government in FY 2012.

U.S. Army Contracting Command-Warren Controls Over Contractor Performance Were Effective

One example of effective Government controls over contractor performance was the High-Temperature Silicon Carbide Semiconductors project managed by the U.S. Army Tank and Automotive Research and Development Engineering Center (TARDEC). The objectives of the project were to demonstrate the feasibility of silicon carbide power electronics and to overcome the main barriers to commercial development of this technology. Silicon carbide components are smaller, more efficient, and can operate at higher temperatures. The U.S. Army Contracting Command (ACC) officials awarded three contracts for this project and prepared an adequate QASP for each contract that described the work to be done and the methods of surveillance to monitor work performed. The ACC used TARDEC electrical engineers with technical expertise in the contracts' requirements to act as contracting officer's representatives (CORs). One method of COR surveillance was reviewing the vendor's quarterly technical reports. The technical reports identified potential problems and associated mitigation strategies. Another method of surveillance was reviewing contractor expenditures for the major cost elements, such as direct labor, subcontractor costs, and overhead. In addition to analyzing the progress reports, the CORs attended quarterly status meetings with the vendors to discuss issues relating to contract performance. Quarterly status meeting minutes indicated that the CORs provided guidance to the contractor. ACC officials also reviewed Wide Area Workflow invoices, expenditure reports, and vouchers. These methods of surveillance were continuous and thorough. The Army controls over performance were effective.

The Navy Needed to Improve Contractor Oversight for a NTEET Project

For the F-18 Energy-Efficiency Improvements project, the Navy took steps to provide adequate surveillance, but technical difficulties still led to delays. The primary objective of the project was to develop and test technology to improve the fuel efficiency of the F-414 engine used in the F/A-18 E/F/G models.

The U.S. Navy Naval Air Systems Command (NAVAIR) contracting officials awarded one contract and a modification to General Electric (GE) for this project. Though NAVAIR officials were not required to prepare a QASP for the project, the command used other means to perform contractor surveillance and oversight. The NAVAIR contract with GE included Federal Acquisition Regulation Clause (FAR) 52.246-9, "Inspection of Research and Development," that allowed for visits to the place of performance and gave the Government the authority to inspect and evaluate the work performed. After a 12-month delay in the delivery schedule, NAVAIR officials subsequently placed a technical representative at GE facilities from August through October 2010 to conduct contract surveillance during the engine building and assembly phase. NAVAIR officials stated that NAVAIR headquarters officials and GE held weekly conferences to discuss the progress of the engine assembly. GE also provided program updates and status on testing, findings, and recommendations to NAVAIR officials. In addition, the NAVAIR on-site technical representative held daily meetings with GE to obtain status reports and discuss plans to mitigate further delays in the delivery schedule. As of November 2011, a NAVAIR official stated that all required tests were completed and preliminary data results were provided to NAVAIR on October 31, 2011. In addition, GE reported in the fourth quarter 2011 recipient report, that they were waiting for NAVAIR to approve the test reports and the contract would close the first quarter of 2012.

The Defense Contract Audit Agency (DCAA) memorandum, “Authorization for Direct Submission of Public Vouchers,” February 9, 1998, permitted GE to directly submit public vouchers to the Defense Finance and Accounting Services (DFAS). DCAA will review GE’s procedures for preparing public vouchers as part of its ongoing surveillance of the contractor’s billing system. GE submitted 28 public vouchers, valued at \$15 million, between May 8, 2009, and November 5, 2010, to bill on cost-reimbursement contract action N00019-09-G-0009, delivery order 0005. According to a Defense Contract Management Agency (DCMA) official, surveillance spreadsheets were updated each time DCMA became aware of a contract modification issued by the contracting activity and/or a public voucher was submitted to DFAS for payment. Furthermore, the spreadsheet allowed the administrative contracting officer to ensure compliance with limitation of cost/funds by tracking funding and payments as well as cost versus fee expenditures. According to DCAA, the cost reimbursable provisional payments are subject to audit at a later date.

In late 2010, NAVAIR reimbursed GE for its final billing of obligated Recovery Act funds allocated under the contract to complete the new engine but GE had not met the original contract-required delivery dates for associated engine test data. According to NAVAIR contracting officials, this late delivery was due to increased technical risk regarding engine ceramic blade technology efforts that were not understood at contract inception because this was the first time the effort had been attempted. Continuing the project would have required additional Recovery Act or non-Recovery Act developmental funds that were not designated for the effort. Therefore, the effort would have to be either funded again as a NAVAIR special project or made a part of the Navy’s regular budget in a later budget cycle. In either case, progress on the project would have stopped until a new appropriation was made available for the special project. Because technical development was nearly complete, NAVAIR and GE negotiated a contract modification on January 31, 2011, to change the order from a cost-plus-fix-fee basis to a firm-fixed-price basis allowing GE to complete the work within the established Recovery Act contract price. It also allowed the Navy to receive the required data and allowed GE to potentially demonstrate the successful application of the ceramic blade technology for future military and commercial use.

Controls Over Recipient Reporting Were Generally Effective

Government controls over NTEET project contractor recipient reporting were generally effective for reviewing information on the Government Web sites. However, a few minor deficiencies occurred for project description and subcontractor reporting in several recipient reports.

One example of effective recipient reporting controls for reviewing information on Government Web sites is the DoD-Wide Fuel-Efficient Ground Vehicle Demonstrator project managed by TARDEC. A TARDEC project official reviewed and analyzed the recipient reports submitted by the contractor and posted on www.FederalReporting.gov. We compared the information on the Web site for the total dollar value of the project, project status, and general purpose of the award, nature of activities, and location of work being performed to the information documented in the contracting file. However, according to the TARDEC project official, he detected some errors in the recipient reporting. For example, the contractor’s recipient report did not accurately state contractor’s fund source code. TARDEC project officials notified the contractor about discrepancy in the code. Also, the contractor did not include a subcontractor’s information until the first quarter 2011 recipient report although the contract was awarded in the first quarter of

2010. The remaining three reports for 2010 also did not include that subcontractor's information as they should have.

Two other examples of effective recipient reporting were the Advanced Manufacturing Techniques for Large Area Solid-Oxide Fuel Cells and Other Energy Applications project and the Foil-Bearing Centrifugal Cathode Air Blower project at the Air Force Research Laboratory (AFRL). In both cases, AFRL implemented effective procedures to validate the accuracy of contractor-reported information.

The contractor submitted the required recipient reports for the Advanced Manufacturing Techniques for Large Area Solid-Oxide Fuel Cells and Other Energy Applications project on www.FederalReporting.gov for the fourth quarter of 2009 and all quarters in 2010 and submitted a final report on January 7, 2011. The Foil-Bearing Centrifugal Cathode Air Blower contractor also submitted the required quarterly recipient reports that were posted on the Government Web site for the fourth quarter of 2009 and the first two quarters of 2010 and submitted a final report on July 15, 2010. After reviewing the Web site recipient reports and the AFRL contract files, we concluded the recipient-reported information for both projects accurately reflected the project description, cost, status, and scope of work being performed. The report narratives for both projects included extensive and informative descriptions, including a complete description of the overall project and expected outcomes.

Controls Over Contracts Awarded To Qualified Small Businesses Were Generally Effective

Government controls for validating the certifications for the three NTEET project contracts awarded to small businesses were generally effective in making awards to qualified Section 8(a) and other small business contractors. NTEET project contracting officials made awards both competitively and noncompetitively to various types of small businesses. Small business participation included the SBIR program and the Section 8(a) Business Development program.* The Small Business Administration (SBA) maintains overall Federal policy for SBIR, directs 11 Federal agencies' implementation of SBIR, reviews their progress, and reports annually to Congress on the program's operation. As required by public law, the SBA is responsible for ensuring that the 11 Federal agencies reserve a portion of their overall research and development extramural budget for award to small businesses.

The SBIR contractual process is structured into the following three phases:

- Phase I: initial determination of technical feasibility,
- Phase II: prototype development, and
- Phase III: commercialization of the technology in either the military or private-sector markets.

*Small businesses self-certify their status with the Small Business Administration (SBA), Central Contractor Registration, and Online Representations and Certification Application. To qualify as a small business, the company must meet the SBA-established size standards for the North American Industry Classification System for which they plan to claim small business status. These standards are either average annual revenues (for the last 3 years) or number of employees, and this information must be applied to the company as a whole, not for a specific subsidiary. Small businesses must also update their status every year.

The purpose of the Section 8(a) Business Development program is to promote the business development of small business concerns owned and controlled by socially and economically disadvantaged individuals so that such concerns can compete on an equal basis in the American economy. Army and Air Force contracting officers awarded three of the six projects in our sample to small businesses. They awarded the Fuel-Efficient Ground Vehicle Demonstrator project to a Section 8(a) contractor and awarded the Advanced Manufacturing Techniques for Large Area Solid-Oxide Fuel Cells and Other Energy Applications and the Foil-Bearing Centrifugal Cathode Air Blower projects as part of the SBIR program.

An example of contracting officials properly validating the contractors' SBIR status is the Foil-Bearing Centrifugal Cathode Air Blower project. AFRL awarded this SBIR Phase II contract as the result of the successful completion of the small businesses' Phase I contract. The Phase I contract was competitively awarded based on the scientific and technical merit of the proposal submitted that addressed the goals and objectives described in the solicitation of topics from the Air Force. This SBIR contractor was required by law to meet the Federal Government's definition of a small business; even though, the contractor could self-certify the business status when submitting the proposal for this topic from the Air Force FY 2008 solicitation lists. AFRL contracting officials reviewed and obtained copies of the reports from the Online Registration and Certification Application (OCRA) and verified the North American Industry Classification System (NAICS) code as part of the contracting file. As required, the contractor used various NAICS codes for machine shops. The contractor also certified that the business had 50 or fewer employees and had average annual gross revenues of \$5 million to \$10 million, which is within the criteria for small businesses. The contractor was a qualified small business under the SBIR definition, and the Air Force controls were sufficient.

Review of Internal Controls

DoD Instruction 5010.40, "Managers' Internal Control Program (MICP) Procedures," July 29, 2010, requires DoD organizations to implement a system of internal controls that provides reasonable assurance about the effectiveness of the controls. We did not identify any internal control weaknesses, as defined by DoD Instruction 5010.40, regarding the ACC, TARDEC, NAVAIR, and AFRL compliance with Government controls over contractor performance, recipient reporting, and contracts awarded to qualified small businesses.

Audit Standards

We conducted this performance audit from January 2011 through December 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Audit Scope and Methodology

We visited the ACC and TARDEC at U.S. Army Tank-Automotive and Armaments Life Cycle Management Command, Warren, Michigan; NAVAIR, Patuxent River, Maryland; and AFRL-Wright Patterson Air Force Base, Dayton, Ohio, to review the six selected NTEET projects. We

interviewed program personnel and contracting officials at each location. We met with contracting and program officials for the selected NTEET projects and reviewed the contracts and documents in the contracting file to determine what tools and techniques were used to monitor contract performance. We reviewed contracting and financial documentation from August 2009 to March 2011. We used this supporting documentation to determine whether the Government controls over contractor performance and recipient reporting met the OMB and DoD Recovery Act implementation and transparency requirements.

The NTEET program consists of energy research projects by the Military Services to increase fuel efficiency or advance new technologies for alternative energy sources. We non-statistically selected six NTEET program projects to review to determine whether DoD efforts complied with Recovery Act requirements, OMB guidance, the FAR, and DoD implementing guidance. Nine Recovery Act contracting actions valued at approximately \$42 million were included in the six projects. Our selection sample was based on reviewing projects with a prototype or demonstrator as a deliverable and represented projects from each Military Service, including SBIR.

We reviewed controls that related to both Recovery Act monitoring and general research and development project oversight, which included:

- Government QASPs,
- technical reports from the contractor,
- status meetings between the contractor and the Government,
- contractor-submitted invoices (to evaluate accuracy and identify inconsistencies), and
- the contract clause for Government inspection.

To evaluate controls over Recovery Act recipient reporting, we reviewed:

- recipient (contractor) reports on www.recovery.gov and www.FederalReporting.gov for the quarters ending September 30, 2010, and December 30, 2010, for accuracy and completeness and
- procedures for Government validation of contractor-reported information.

To evaluate controls over contracts awarded to small businesses, we reviewed:

- original contract and options awarded to the contract;
- ORCAs for the number of employees and amount of annual revenue of the small business entity receiving the award;
- NAICS codes; and
- entries posted on the Federal Procurement Data System (FPDS) for the business category, product, and small business information.

We reviewed the Recovery Act, the FAR, various White House memoranda, and various OMB memoranda. We determined whether QASPs were used and the methods of surveillance. We reviewed the contractor's technical reports and minutes of status meetings between the contractor and the Government to resolve project issues. Specifically, we reviewed selected payment requests to determine whether the request matched the work performed and reviewed the contracts to see if they included the FAR clause 52.246-9, which gives the Government the right to visit the place of performance for inspection.

We reviewed selected recipient reports posted by contractors on www.FederalReporting.gov and on www.recovery.gov for the third and fourth quarters of calendar year 2010 (submitted in October 2010 and January 2011) and compared the information with contract files and the FPDS. For some projects with reporting deficiencies, we reviewed the recipient report for the first quarter of 2011 (submitted in April 2011). We also determined whether contracting officials were taking corrective action against contractors with recipient reporting deficiencies.

We determined whether the contracting personnel properly validated contractor Section 8(a) status by identifying small business Section 8(a) actions at each site from the FPDS. We reviewed contract files to determine whether contracting officials reviewed each small business status by obtaining reports from the ORCA Web site and the NAICS. We also met with contracting officials to determine their procedures for validating contractor Section 8(a) business status.

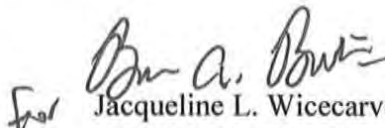
Use of Computer-Processed Data

We used computer-processed data to perform this audit. Specifically, we used project data posted on the Recovery Act Web site www.recovery.gov in meeting our audit objectives. We tested the accuracy of the data by comparing the project data reported on the Recovery Web site with documents in the contract file. Our audit focused on the reporting of contract actions on specific Recovery Act projects. From these procedures, we concluded that the data were sufficiently reliable for our audit purposes.

Prior Audit Coverage

The Government Accountability Office, the DoD Inspector General, and the Military Departments have issued reports and memoranda discussing DoD projects funded by the Recovery Act. You can access unrestricted reports at <http://www.recovery.gov/accountability>.

We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 604-9077 (DSN 664-9077). If you desire, we will provide a formal briefing on the results.


Jacqueline L. Wiccarver
Assistant Inspector General
Acquisition and Contract Management

Attachment:
As stated

Summary of NTEET Projects and Government Controls

1. High-Temperature Silicon Carbide Semiconductors-Army

Contract Number	Contractor	Contracting Activity	Contract Action Value
W56HZV-10-C-0113	Science Applications International Corporation	U.S. Army Contracting Command-Warren, Michigan	\$6,793,410
W56HZV-10-C-0114	Teledyne Scientific & Imaging, LLC	U.S. Army Contracting Command-Warren, Michigan	\$2,272,394
W56HZV-10-C-0115	RCT System, Inc.	U.S. Army Contracting Command-Warren, Michigan	\$3,073,869

Project Objective and Background. The total amount awarded for the three Recovery Act contracts was \$12,139,673. This project is for the development of efficient, high-temperature silicon carbide power electronics for military vehicles using hybrid electric mobility and power generation systems. Recovery Act contractors have completed the preliminary designs for Silicon Carbide Semiconductors. As of July 2011, the work on the largest contract was more than 50 percent complete. For the two other contracts, one contractor reported less than 50 percent of the work was complete, and the other contractor reported more the 50 percent of the work was completed. However, the 2-year program remains on schedule for February 2012 completion.

Contractor Performance Controls. Government controls over contractor performance for the project were generally effective.

Recipient Reporting Controls. ACC procedures were effective in managing the contractor's recipient reporting information published on www.recovery.gov. ACC appointed TARDEC project officials as the CORs, and ACC assigned the responsibility of reviewing and analyzing contractor-submitted reports to the CORs. The CORs communicated regularly with the contractors and provided assistance to clarify instructions about the reporting requirements. The total dollar value for the project, project status, general purpose of the award, and location of work performed was supported by documents in the contracting file for two of the three contractors. However, the CORs identified a deficiency in the description of the project and directed the contractor to provide more information on the purpose of the award and project activity. The corrective action taken by ACC officials was evident in the subsequent report (for the first quarter of 2011), which contained a more detailed description of the purpose of the award and the project activities. ACC controls over recipient reporting were effective.

Small Business Controls. Not applicable as the award was made to a large business.

2. F-18 Energy-Efficiency Improvement-Navy

Contract Number	Contractor	Contracting Activity	Contract Action Value
N00019-09-G-0009 (task order 0005)	General Electric Company	Naval Air Systems Command, Patuxent River, Maryland	\$7,500,000
N00019-09-G-0009- 0005-01	General Electric Company	Naval Air Systems Command, Patuxent River, Maryland	\$7,500,000

Project Objective and Background. The primary objective of the project is to develop and test technology to improve the fuel efficiency of the F-414 engine used in the F/A-18 E/F/G models. Specifically, the project objectives were to:

- demonstrate technologies capable of reducing fuel consumption of the F-414 engine through a single-engine test build,
- quantify the magnitude of actually demonstrated and analytically predicted fuel quantity savings based on test data acquired using those technologies individually and as a full-technology suite,
- provide a Fleet incorporation scheme of the technologies, and
- provide a cost estimate for incorporating the technologies for maximum fuel savings in the shortest amount of time.

NAVAIR issued two cost-plus-fixed-fee contract actions to GE, N00019-09-G-0009 (delivery order 0005) and N00019-09-G-0009 (delivery order 0005 modification 01), valued at \$7,500,000 each, for a total of \$15 million. As of July 2011, GE reported to NAVAIR that a major engine test would be completed by August 31, 2011, and the demonstrator engine would be completed by October 2011, resulting in a project status of 50 percent or more complete with a 12-month delay in the overall schedule.

Contractor Performance Controls. Government controls over contractor performance for the project were generally effective.

Recipient Reporting Controls. NAVAIR contracting officials effectively reviewed and validated contractor quarterly recipient reports for the third and fourth quarters of calendar year 2010 posted on www.FederalReporting.gov and www.recovery.gov. The recipient's reports contained all information required by OMB. Recipient's reports were submitted on time as required by OMB guidance. Contractor reports included a description of the overall purpose and expected outcomes and complied with OMB requirements by providing narrative descriptions that were sufficiently clear for the general public to understand. NAVAIR officials used "Guidance for Reviewing Contractor Reports," December 16, 2009, provided by the Director, Defense Procurement and Acquisition Policy to review the recipient reports.

Small Business Controls. Not applicable as the award was made to a large business.

3. Hybrid Unmanned Aerial Vehicle Renewable Propulsion System-Air Force

Contract Number	Contractor	Contracting Activity	Contract Action Value
FA8650-08-C-2935-P00003	Northrop Grumman Systems Corporation	Air Force Research Laboratory, Wright- Patterson, AFB Dayton, Ohio	\$4,859,929

Project Objective and Background. The project objective is to develop a renewable, long-endurance, unmanned aerial vehicle using four-junction photovoltaic power to renew a fuel-cell-based power system and highly efficient electric propulsion. AFRL modified a previously competed cost-plus-fixed-fee contract on July 17, 2009, valued at \$4,859,929, to incorporate Recovery Act work. As of August 2011, this project was completed.

Contractor Performance Controls. Government controls over contractor performance for the project were generally effective. AFRL project engineers received contractor bi-monthly technical status reports to summarize each task performed, the progression of the performance (including milestones), and task status for the reporting period. AFRL contracting officials stated that Air Force Instruction 63-101, "Acquisition and Sustainment Life Cycle Management," Chapter 4, "Acquisition of Services," exempted research and development projects from requiring the use of a QASP. However, a project engineer was assigned as a technical monitor to perform inspections on contractor performance. AFRL contracting officials stated that to ensure accuracy, they reviewed contractor fund status reports and compared the reports to the actual funds expended. AFRL contracting officials did not include FAR clause 52.246-9 in the contract for this project from July 2009 through March 2011. On March 31, 2011, the AFRL contracting officer issued a unilateral modification to include the FAR clause. According to the AFRL contracting official, the absence of the clause did not result in any adverse effect as AFRL personnel have never been denied access to the contractor's facilities.

According to the AFRL officials, DCMA approved the submission of vouchers from the prime contractor directly to DFAS for payment. The contractor submits vouchers to DFAS on a monthly basis. Northrop Grumman Systems Corporation submitted 19 public vouchers, valued at more than \$4.5 million, between August 31, 2009, and February 28, 2011, on cost-plus-fixed-fee contract action FA8650-08-C-2935-P00003. The AFRL official provided a summary report with detailed transactions that recorded cost, contract number, report date, and the balance remaining after each transaction. We compared the summary report to the voucher amount paid each month by DFAS and we were able to clearly reconcile the voucher amounts to the quarterly reports. According to AFRL officials, all cost-plus-fixed-fee contracts are subject to an incurred cost audit of all claimed costs after the conclusion of the performance and that all vouchers are considered "provisional payments" until after negotiations between the contractor and the DCMA administrative contract officer are complete. AFRL officials also stated that all claimed costs on this contract are subject to an audit to establish the final costs due to the contractor.

Recipient Reporting Controls. AFRL contracting officials effectively reviewed and validated contractor quarterly recipient reports on www.recovery.gov. The quarterly reports were generally clear, understandable, and complete and described the purpose of the award, activities that were performed, and the locations of the prime contractor and subcontractors. The reports also included cumulative costs and the status of project outcome for each quarter including jobs created. The last quarterly report was dated October 6, 2011.

Small Business Controls. Not applicable as the award was made to a large business.

4. Fuel-Efficient Ground Vehicle Demonstrator-DoD-Wide

Contract Number	Contractor	Contracting Activity	Contract Action Value
W56HZV-06-C-0406 P00042	World Technical Services, Inc.	U.S. Army Contracting Command-Warren, Michigan	\$8,748,000

Project Objective and Background. The project objective is to integrate the system-level concepts into a demonstrator that maximizes fuel economy improvement for the next generation of Army ground vehicles. The specific project goal is to design and fabricate one full-scale ground vehicle system demonstrator to display fuel efficient concepts while maintaining tactical vehicle capability. ACC awarded an option for \$8.75 million in August 2009 under the original contract for this project. The contractor has entered the build phase of the project, which includes purchasing, fabrication, and assembly. These activities are occurring at the same time and this phase is expected to conclude by the end of the fourth quarter of 2011. As of July 2011, this project was more than 50 percent complete.

Contractor Performance Controls. Government controls over contractor performance for the project were generally effective. ACC contracting officials awarded an option under an existing contract for the project and appointed TARDEC project officials as the CORs. Also, the existing QASP continued for this option. Additional surveillance included contractor-submitted monthly progress reports to the CORs, and the CORs made weekly site visits to perform inspections on contractor performance. TARDEC project officials stated that the project manager and business manager reviewed and approved the contractor vouchers for payment.

Recipient Reporting Controls. Government controls over recipient reporting for the project were generally effective.

Small Business Controls. Government controls over contracts awarded for the project to this Small Business were generally effective.

5. Advanced Manufacturing Techniques for Large Area Solid-Oxide Fuel Cells and Other Energy Applications-SBIR

Contract Number	Contractor	Contracting Activity	Contract Action Value
FA8650-09-C-2016	Optomec, Inc.	Air Force Research Laboratory, Wright-Patterson, AFB Dayton, Ohio	\$622,896

Project Objective and Background. The objective of the project is to build on prior successful work conducted under the SBIR Phase II Program that showed unique capabilities and advantages of using Aerosol Jet deposition technology to fabricate high-performance solid-oxide fuel cells. Specifically, this project will focus on the development of enhancements to the Aerosol Jet system and hardware necessary for cost-effective commercial production of solid-oxide fuel cells. The supplemental project consists of the following five tasks:

- Large-Area Printing Enhancements,
- Ancillary Hardware Enhancements
- Production Platform Design Concepts,
- Cell Characterization/Analysis and Ink Optimization, and.
- Application Development.

As of January 2011, the contractor completed approximately 100 percent of the project tasks funded by Recovery Act and expended all Recovery Act funds.

Contractor Performance Controls. Government controls over contractor performance for the project were generally effective. AFRL officials monitored contractor performance through DCMA project engineers that were appointed as the technical representatives. AFRL contracting officials stated that Air Force Instruction 63-101 exempted research and development projects from requiring the use of a QASP. The technical representatives were responsible for monitoring the costs, technical, and schedule performance and informing the contracting officer of any problems. In addition, the contracting officials obtained and reviewed the public payment vouchers in the Wide Area Workflow that were submitted by the contractor and paid by DFAS. The contract contained the FAR clause 52.246-9. As of December 31, 2010, the AFRL contractor completed the tasks funded by Recovery Act and expended all the funds. The controls over contractor performance were adequate.

Recipient Reporting Controls. Government controls over recipient reporting for the project were generally effective.

Small Business Controls. Government controls over awarded for the project to this Small Business were generally effective.

6. Foil-Bearing Centrifugal Cathode Air Blower-SBIR

Contract Number	Contractor	Contracting Activity	Contract Action Value
FA8650-09-C-2043	R & D Dynamics Corporation	Air Force Research Laboratory, Wright-Patterson, AFB Dayton, Ohio	\$480,000

Project Objective and Background. The project's objective is to reduce the size and weight of solid-oxide fuel cell power systems for unmanned aerial vehicle applications to make future unmanned aerial vehicle lighter and more fuel-efficient. The technology will further enable the Air Force to move toward more electric aircraft. In addition, the technology will have an additional benefit to land- and sea-based vehicles use of solid-oxide fuel cell power systems. As of July 2010, the contractor completed less than 50 percent of the task. The Air Force obligated, and the contractor expended, all Recovery Act funds for the project. However, the contract work is continuing with non-Recovery Act Air Force funding.

Contractor Performance Controls. Government controls over contractor performance for the project were generally effective. AFRL officials monitored contractor performance through the use of quarterly status reports, DCAA audits, and e-mails. AFRL contracting officials stated that Air Force Instruction 63-101 exempted research and development projects from requiring the use of a QASP. The contracting officials reviewed the quarterly status reports, which contained the technical information and status of the project. In addition, the contracting officials obtained and reviewed the public payment vouchers in the Wide Area Workflow that were submitted by the contractor and paid by DFAS. The contract contained the FAR clause 52.246-9. As of September 30, 2010, AFRL obligated and expended all Recovery Act funds for this SBIR Phase II project, and the contractor posted the final report on www.FederalReporting.gov. Three prototype cathode air blowers were produced with Recovery Act funds that met Air Force specifications and were designed, manufactured, tested, and delivered to the United Technologies Research Center. The Government controls over contractor performance were adequate.

Recipient Reporting Controls. Government controls over recipient reporting for the project were generally effective.

Small Business Controls. Government controls over SBIR Small Business for the project were generally effective. AFRL awarded this SBIR Phase II contract as a result of the successful completion the small business's Phase I contract. The Phase I contract was competitively awarded based on the scientific and technical merit of the proposal submitted that addressed the goals and objectives described in the solicitation of topics from the Air Force. This SBIR contractor self-certified the business status with the initial application for the SBIR program and again when submitting the proposal for this topic from the Air Force FY 2008 solicitation lists. AFRL contracting officials obtained copies of the reports from the ORCA Web site and verified the NAICS codes as part of the contracting file. The contractor used the NAICS code 333415 for air-conditioning and

warm air heating equipment. The contractor certified that the business had 50 or fewer employees and had average annual gross revenues of \$3.5 million to \$5 million.



Inspector General Department of Defense